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contents of courses given in the University for the training of teachers in colleges and secondary schools."

Contents—"I: What benefits should be derived from the study of mathematics? II: Suggestions as to methods of studying mathematics. III: Mathematics and activities subsequent to college years—A. Occupations for which concentration in mathematics is desirable; B. Occupations for which concentration in mathematics combined with other subjects is desirable; C. Fields of work in which mathematical training or some knowledge of mathematics is desirable. IV: Departmental Directions."

A limited number of these pamphlets are available for distribution to those interested.

*The Teaching of Geometry.* By ARCHIBALD HENDERSON. *The University of North Carolina Record.* Extension series no. 39, October, 1920. 49 pages. Price 50 cents.

Headings of sections: Introduction, 3-4; The aims and results of geometrical study, 5-8; The problem of instruction (Text, teacher, pupil), 9-14; Analysis versus synthesis, 15-21; The basic problems of construction, 22-27; The problem of research, 28-45; Procedure in attacking geometrical problems, 45-48; Bibliographical note, 48-49.

#### NOTES.

Professor A. L. Candy's article in this MONTHLY (1920, 195-199) entitled "A mechanism for the solution of a equation of the  $n$ th degree" is reproduced in abridged form, and in Spanish, in *Revista Matemática Hispano-Americana*, December, 1920, pp. 308-309.

Reference may be given to two articles in *Monatshefte für Mathematik und Physik*, volume 30, Vienna, 1920 (216 pages). One is "Papierstreifenkonstruktion einer durch konjugierte Durchmesser gegebenen Ellipse" by K. Mack (pages 103-104); the other "Die Verallgemeinerung der Feuerbachschen Sätze" by L. Klug (pages 131-152). It is pointed out that Mack's construction is essentially that given in De La Hire, *Sectiones Conicæ*, Paris, 1685, pp. 198-199.

A series of articles, by B. LEFEBURE, published in *Revue des Questions Scientifiques* has been collected and issued in book form with the title: *Notes d'histoire des mathématiques (Antiquité et moyen âge)* (Louvain, Société Scientifique de Bruxelles, 11 rue des Récollets, Louvain, 1920; 8vo; 154 pages). The articles dealt with numeration and the origin of our numerals, and the history of mathematics in antiquity and in the middle ages till after the contributions of Arabian science.

An elaborate volume *Cicero: a Biography* by Torsten Peterssen (University of California Press, 1920, 5 + 699 pages) was issued as one of the series "Semi-centennial Publications of the University of California, 1868-1918." The following paragraph based on information in Cicero's *Tusculans* occurs on page 173:

"The grave of the great mathematician Archimedes was supposed to be in Syracuse, but the Syracusans had neglected it, did not know where it was, and even denied its existence.<sup>1</sup> Cicero was familiar with a description in verse of the tomb, to the effect that it contained a globe and a cylinder. In company with some prominent citizens of Syracuse, he went to a burial place by one of the gates, and there, after some search, he found a small column with a globe and cylinder. It was almost covered with weeds. When these had been removed, the verses remembered by Cicero were found on the front of the pedestal, but only the beginnings of the lines were still legible. 'To think,' exclaims Cicero, with the amateur's delight, 'that I, an Arpinate, should find the grave of Archimedes, the most famous citizen of Syracuse, when his fellow-citizens knew nothing about it!' In a small way, the incident is indicative of a greater movement; the Greeks were yielding their places to the Romans in nearly every sphere; in the next generation, largely as a result of Cicero's literary activity, Rome would produce authors far superior to their Greek contemporaries. As for Archimedes, Cicero seems to have studied mathematics and may have had some faint understanding of his greatness."

In the *Scientific American Monthly* for March, 1921, volume 3, pages 196-198, is one of the essays submitted in competition for the prize of five thousand dollars offered by the *Scientific American* [1921, 191]. It is entitled "The quest of the absolute; an essay on modern developments in theoretical physics." The author is Dr. F. D. MURNAGHAN, associate in applied mathematics, Johns Hopkins University. The following editorial comment is added in connection with publication of the article:

"The Judges and the Einstein Editor have no hesitation in pronouncing the essay of Dr. Murnaghan, presented herewith, to be, for the man who is equipped to read it with full understanding, altogether the most illuminating of the essays submitted in the contest, if not indeed the most successful discussion of comparable length that has appeared anywhere. The Judges were agreed that Dr. Murnaghan's essay was of doubtful value before a general audience, and that in the presence of an essay such as Mr. Bolton's appeared to be it could not properly claim the prize; but it is so very good of its kind that they clung to the last moment to the possibility of its being the best; and only allowed it to be eliminated from their consideration after the most searching examinations of Mr. Bolton's work had shown that it was all it seemed to be.

"This criticism of Dr. Murnaghan's work makes it plain that it demands publication, and equally plain that the place for it is here, rather than in the *Scientific American* proper. By all means it deserves the distinction of being the first of the competing essays to appear in the *Scientific American Monthly*, and we hasten to give it this distinction.—Editor."

About a year ago (1920, 218) we listed the thirteen volumes of the great edition of Euler's *Opera Omnia* which had been published at that time. Two more volumes have now been issued from the press making five published since the outbreak of the war. They are: *Institutiones Calculi Integralis*, part 3, edited by Engel and Schlesinger; *Abhandlungen aus der Integralrechnung*, 2 volumes, edited by Gutzmer and Liapounoff; *Abhandlungen aus der Arithmetik*, 2 volumes, edited by Rudio. The volume on *Algebraische Abhandlungen*, edited by Rudio, Stäckel, and Krazzer, is practically complete; and the volume on *Artilleriewesen*, edited by Scherrer is in galley proof.

<sup>1</sup> In William Forsyth's *Life of Marcus Tullius Cicero*, London, 1864, vol. 1, p. 51, the following lines are quoted:

"When Tully paused amidst the wreck of time  
On the rude stone to trace the truth sublime;  
Where at his feet, in honored dust disclosed,  
The immortal sage of Syracuse reposed."

Who wrote these lines? The incident here mentioned occurred about 75 B.C. when Cicero was 32 years of age. Archimedes died 212 B.C.—EDITOR.

The Euler Commission of the Swiss Society of Naturalists issued to its subscribers, in December, 1920, a statement<sup>1</sup> including the following:

"It has been possible, in spite of all difficulties to prepare five volumes of the Euler edition during the past years. Being convinced however that to many subscribers at the present time it would be a great hardship to receive such a number of volumes at once, the Euler Commission permits itself to make a present of four of these volumes and to ask for the subscription price to the fifth volume only. This applies to all subscribers, not only to private persons but also to the academies and other learned societies, as well as to the libraries.

"Pray do not conclude from this action that the financial position of the Euler undertaking is brilliant. Altogether otherwise, we look to the future with grave misgivings. Not only are the costs of composition increased more than ten fold over those before the war, but we meet also earlier unsuspected difficulties on account of the low value of money in many states. A continuation of the undertaking can therefore only be possible if all of our subscribers remain faithful to us and if we are successful in finding yet others.

"We earnestly beg you therefore, to continue to retain your highly prized good will towards the great Swiss work of the Euler Edition and to help us to bring to a happy conclusion the undertaking which has been commenced."

#### ARTICLES IN CURRENT PERIODICALS.

**AMERICAN JOURNAL OF MATHEMATICS**, volume 43, no. 1, January (published March), 1921: "Multiple binary forms with the closure property" by A. B. Coble, 1-19; "Einstein's, theory of gravitation: Determination of the field of light signals" by E. Kasner, 20-28; "Note on Einstein's equation of an orbit" by F. Morley, 29-32; "A one-to-one representation of geodesics on a surface of negative curvature" by H. M. Morse, 33-51; "Conjugate systems with indeterminate axis curves" by E. P. Lane, 52-68.

**ANNALS OF MATHEMATICS**, second series, volume 22, no. 3, March, 1921: "The asymptotic expansion of the Sturm-Liouville functions" by F. H. Murray, 145-156; "On the conformal mapping of a region into a part of itself" by J. F. Ritt, 157-160; "Conjugate nets  $R$  and their transformations" by L. P. Eisenhart, 161-181; "The applications of modern theories of integration to the solution of differential equations" by T. C. Fry, 182-211.

**EDUCATIONAL ADMINISTRATION AND SUPERVISION**, volume 7, no. 2, February, 1921: "Subject matter courses in mathematics for the professional preparation of Junior High School teachers" by P. M. Symonds, 61-76.

**L'ENSEIGNEMENT MATHÉMATIQUE**, volume 21, nos. 3-4 (published December, 1920): "Sur un théorème de cinématique" by C. Cailler, 163-169; "Généralisation des coordonnées polaires. Applications" by E. Jablonski, 170-175; "Sur les systèmes de nombres bicomplexes" by L.-G. Du Pasquier, 175-183; "Développement d'une puissance quelconque, entière et positive, de  $\cos x$  ou de  $\sin x$  en fonction linéaire des  $\cos$  et  $\sin$  de multiples de  $x$ " by E. Barbette, 184-187; "Analyse indéterminée du  $p^{\text{me}}$  degré sur les sommes de puissances égales des nombres" by E. Barbette, 188-191; "Congrès international des mathématiciens. Strasbourg, 22-28 septembre 1920," 192-209; "Les travaux de la Section de Mathématiques et d'Astronomie de l'Association française pour l'Avancement des Sciences," 209-215; "Société mathématique suisse," 215-229; "Chronique," 229-231; "Notes et documents," 232-236; "Bibliographie," 236-243; "Bulletin bibliographique," 243-250.

**GRINNELL REVIEW**, Grinnell College, volume 16, March, 1921: "Vindicating Euclid and Newton" [review of Girolamo Saccheri's *Euclides Vindictatus*, translated by G. B. Halsted (Chicago, 1920) and of F. Cajori's *A History of the Conceptions of Limits and Fluxions in Great Britain from Newton to Woodhouse* (Chicago, 1919)] by R. B. McClenon, 379.

**LITERARY REVIEW**, published by New York Evening Post, volume 1, January 15, 1921: "The rudeness of poets" by Christopher Morley, 7 [First paragraph: "The poet who has not learned how to be rude has not learned his first duty to himself. By 'poet' I mean, of course, any imaginative creator—novelist, mathematician, editor, or a man like Herbert Hoover. And by 'rude' I mean the strict and definite limitation which, sooner or later, he must impose upon his sociable instincts. He must refuse to fritter away priceless time and energy in the random

<sup>1</sup> *Jahresbericht der deutschen Mathematiker-Vereinigung*, 1921, pp. 52-53.